

ART 34 AMDT

We claim:

1. A process for producing scratch-resistant coatings, which
comprises applying at least one UV-curable coating
composition comprising as its photochemically crosslinkable
constituent a mixture of at least one aliphatic urethane
(meth)acrylate prepolymer PU having at least two double bonds
per molecule and having a viscosity in the range from 250 to
11,000 mPa.s, and at least one reactive diluent, to the
target substrate and curing the resulting wet coating by
exposure to ultraviolet radiation under an inert gas
atmosphere.
2. A process as claimed in claim 1, wherein said UV-curable
coating composition comprises at least one reactive diluent R
selected from difunctional and polyfunctional esters of
acrylic acid and/or methacrylic acid with aliphatic diols or
polyols.
3. A process as claimed in claim 1 or 2, wherein, based on the
overall weight of the coating composition, excluding pigments
and fillers, said coating composition comprises:
- 5 - 90% by weight of at least one aliphatic urethane
(meth)acrylate prepolymer PU;
 - 10 - 95% by weight of at least one reactive diluent R;
 - 0.1 - 5% by weight of at least one photoinitiator;
and, if desired,
 - 0 - 20% by weight of further reactive diluents, and
 - 0 - 15% by weight, preferably 2 - 9% by weight, of additives
customary for coating compositions.
4. A process as claimed in any of the preceding claims, wherein
said urethane (meth)acrylate prepolymer PU has a
number-average molecular weight in the range from 500 to
5000.

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5. A process as claimed in any of the preceding claims, wherein said urethane (meth)acrylate prepolymer PU has a double bond equivalent weight in the range from 250 to 2000, preferably from 300 to 900 daltons.
6. A process as claimed in any of the preceding claims, wherein said urethane (meth)acrylate prepolymer PU is obtainable by successive reaction of at least 25% of the isocyanate groups of a compound (component A) containing isocyanate groups with at least one hydroxyalkyl ester of acrylic acid and/or methacrylic acid (component B) and of any remaining free isocyanate groups with at least one further compound (component C) having at least one functional group which is reactive toward isocyanate groups.
7. A process as claimed in claim 6, wherein component A is a prepolymer which contains isocyanate groups and has at least two isocyanate groups per molecule, obtainable by reacting at least one low molecular mass aliphatic diisocyanate or polyisocyanate with a compound having at least two isocyanate-reactive functional groups, the ratio of isocyanate groups to functional groups being in the range from 3:1 to 1:2.
8. A process as claimed in claim 6 or 7, wherein the isocyanate groups of component A have been reacted in stoichiometric ratio with the OH groups of component B.
9. A process as claimed in claim 6 or 7, wherein at least some of the free isocyanate groups of the urethane (meth)acrylate prepolymer PU have been reacted with molecules which contain an isocyanate-reactive group and a hydrophilic, stabilizing group.
10. A process as claimed in claim 6 or 7, wherein at least some of the free isocyanate groups of the urethane (meth)acrylate prepolymer PU have been reacted with hydroxyalkyl esters and/or alkylamine amides of aliphatic dicarboxylic acids having at least 6 carbon atoms.
11. A process as claimed in any of the preceding claims, wherein the coating composition contains 2 - 40% by weight of one or more pigments, based on the overall weight of the coating composition.

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12. A process as claimed in any of the preceding claims, wherein the coating composition contains 1 - 30% by weight of one or more fillers, based on the overall weight of the coating composition.

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13. A process as claimed in any of the preceding claims, wherein the scratch-resistant coating is designed as a multicoat coating system, comprising the following steps:

10 i. applying a preferably pigmented basecoat material to a substrate surface;

ii. drying and/or crosslinking the basecoat film;

15 iii. applying a topcoat material, said topcoat material being a coating composition as defined in any of claims 1 to 12;

20 iv. curing the topcoat by exposure to UV light under an inert gas atmosphere.

14. A process as claimed in any of the preceding claims, wherein the target substrate has a metallic surface.

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